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BRIEF NOTES

Educational action in the rehabilitation of severe acquired brain injuries: the role of self-awareness

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Abstract

Severe acquired brain injuries (ABI) cause a range of short-or long-term limitations in physical and neuropsychological abilities. The aim of rehabilitation is to promote the harmonious development of the individual through collaboration between medical and educational sciences, involved in the educability of the whole person, in which the aim is not only functional recovery but also social- reintegration.

This "functional synergy" permits the development of the person, and establishes an indissoluble link between functions and attitudes, thus allowing the achievement of the greater possible autonomy. In this way classical and pedagogical rehabilitation may be combined in a single concept of educational action. To realize this integrated educational process it is important to evaluate and promote awareness development, based on the possibilities of brain plasticity and on the presence of multiple intelligences skillfully intertwined each other. Therefore, self-awareness plays a prime role in educational actions for the rehabilitation of persons with severe ABI.

Key words

- neuro-rehabilitation
- educational action
- acquired brain injury
- self-awareness

REHABILITATION APPROACH TO SEVERE ACQUIRED BRAIN INJURY

Severe acquired brain injury (ABI) results from damage to the brain caused by traumatic (*e.g.*, road accidents or job accidents.) or non-traumatic brain injury (*e.g.,* stroke, anoxia, hypoxia, infections, degenerative diseases). It is usually defined as a condition in which the patient has been in coma for at least 24 hours. ABI may need a long period of intensive care or neurosurgery stay with a Glasgow Coma Scale score equal to or less than 8 [1] and/or complex and severe disabilities, which need specific and intensive multidisciplinary rehabilitation.

ABI can cause a wide range of functional short- or long-term limitations in vital functions, consciousness, motility, sensory, thinking, language, behavior and neuropsychological abilities, that require specific rehabilitation treatments [2]. Indeed, rehabilitation is a process that leads the survivors a better quality of life from a physical, functional, social and emotional point of view, increasing the possibilities and the options for the patient's future (Guidelines for rehabilitation activities – Conference State-Region, 2014).

The aim of the clinical-medical practice in the acute phase is to restore the patient's vital functions in order to lead the transfer to post-acute rehabilitation ward where an holistic multidisciplinary approach is recommended. In the last few years, specialization in medicine has had a virtuous trend. From one perspective this super-specialization could provide better clinical solutions, but conversely it could contribute to a sort of patient fragmentation. The risk of exposing the patient to fragmentation of different functions rehabilitation should be avoided by focusing the rehabilitation plan on the person in a holistic perspective. Moreover, it is important to include in the rehabilitation plan the broader network outside health facilities such as the caregiver, school, the work place, the territorial reality, in which the person lives and has lived his daily life. So it would be more appropriate to take a complex view of the person in which the aim of the rehabilitation is not only the functional recovery but also the social reintegration of the survivors [3].

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With this is mind, in order to foster the harmonious development of the individual, it becomes essential to promote the collaboration between the medical and educational sciences, usually involved in the educability of the whole person [4, 5]. "Pedagogy begins with the affirmation of man as individual to study the conditions adequate for reaching a passage from hetero to self-education, expressed in the ability to give oneself one's own development plan (...). The action is educational when organized specifically for the creation or development of new possibilities in the subject, as well as the implementation of existing ones" [6].

Pedagogical and medical knowledge share several common points:

- the birth at the dawn of humanity;
- the topic: man and his mutability;
- the interdisciplinary nature;
- the practical goal to strive for: empiricism and practicality;
- the connection with temporality.

Special pedagogy, as a branch of pedagogy, derives from the union of pedagogy and medicine, with the objective of promoting a "global" care of persons with special needs, and so also with severe ABI, adding globality to an often fragmented complexity [7]. In particular, it aims to educate individuals with special educational needs. "Special Education examines the diversity, which emerges from the interaction between mental processes, psychological and/or behavioral problems associated with the presence of a disabling condition (genetic or acquired)" [8].

The decision to adopt an educational practice stems from the need to foster the development of the person in spite of deficits and disabilities. Larocca [9], referring to law 104/92, proclaims the importance of the interaction between specialists in various areas, in order to allow everyone to work on his own "portion" of the whole, because "Education cannot do much where medicine needs to intervene" but it is also true that "Medicine is powerless where education needs to intervene. "Health care interventions could lead to functional recovery, but a social recovery is often excluded" [3].

As a result, it is necessary to promote a collaboration between medical and pedagogical sciences in order to ensure an harmonic human development. This approach is in line with the guidelines for rehabilitation activities. Indeed, the rehabilitative intervention planned for a single individual involves psychological and social aspects as well as mainly clinical (*i.e.* language, attention, memory rehabilitation). Its overall objective is to define the "individual" by means of therapeutic and care interventions, which aim at recovering impaired abilities and enhancing functional potential. This approach contributes to subjective growth and provides for a better integration into family and social life.

This functional synergy allows developing of the person as a whole, and establishes an indissoluble link between functions and attitudes (defined as "the quality and the goals that each one can realize, thanks to the different use of the functions"), thus allowing the achievement of greater possible autonomy [10]. In this way classical and pedagogical rehabilitation may be combined in a single concept of "educational action". This educational action is directed toward the development of new possibilities and potential in the person as well as to the implementation of existing ones, as provided by classical models of rehabilitation. Rehabilitative intervention becomes more broadly educational or rather directed toward self-education and the achievement of "freedom" for the person, such as the capability to motivate, to make personal sense of their own choices and actions.

In the last twenty years of theoretical and practical development of neuropsychological rehabilitation in the field of ABI, the multidisciplinary integration about clinical, social and psycho-pedagogical aspects, proposed by Bio-Psycho-Social model, has not been fully completed. Within this framework, the rehabilitation professional has the duty of knowing different approaches of intervention and being able to choose the more focused and specific among them. The techniques proposed by classical models can be combined and integrated with an educational approach, according to the needs of both patients and professionals.

THE ROLE OF SELF-AWARENESS

In this perspective, the rehabilitation process must consider first of all the survivors' level of self- awareness, that is the survivors' ability to understand one's abilities and limitations and how they can impact on task performance in everyday living [11]. Indeed, self-awareness impairment is a neuropsychological disorder closely related to the severity of brain damage, consisting in a loss of the ability to "recognize the difficulties caused by the altered brain functioning" [12, 13]. It can be the first and major clinical problem, which limits the whole rehabilitation process and the functional outcome [14]. Self-awareness deficits in brain injury have been reported as occurring in up to 97% of patients with traumatic brain injury depending on the severity of the injury [15].

Good self-awareness of one's state of "health" promotes the "compliance" of the patient to the rehabilitative treatment and the recognition of their limitations and resources. On the other hand, impaired self-awareness can condition the rehabilitative outcomes or in any case slow down the rehabilitative process, with repercussions on social and work reintegration and quality of life [14-16]. According to Toglia and Kirk [17], self-awareness includes: a) *metacognitive* knowledge (or *declarative* knowledge) about one's abilities, which incorporates elements of intellectual awareness and involves the cognition of the present and the past, as well as the planning of future activities (declarative memory); b) *online monitoring* of performance during tasks. This network considers the relationship between different aspects of metacognition (declarative knowledge, "self-efficacy", monitoring and self-adjustment of behavior) and consciousness as a dynamic process rather than as a series of hierarchical levels. On-line monitoring refers to constant control of performance and reflects a model of action and self-regulation in progress (execution system).

Online awareness, which includes continuous monitoring and simultaneous adjustment of performance,

varies depending on task and situation and it is relatively unstable [18]. This can explain why emerging and anticipatory awareness is visible in some tasks and contexts and not in others. Previous knowledge influences and interacts with self-awareness within the context of the task (online awareness) [19].

CONCLUSION

As part of the classic rehabilitation approach to severe ABI, metacognitive self-awareness in particular at lower level, is often one of the first rehabilitation objectives, while metacognitive awareness is the basis of the techniques proposed by the educational approach. As stated by Antiseri [20], "the only way to solve a problem is to know the problem and to become experts on the problem itself". The essential starting point to realize an integrated educational process, focused on educational action, is to evaluate and promote awareness development, based on the possibilities of brain plasticity and on the presence of multiple intelligences skillfully intertwined each other. This process makes it possible for a person to face and solve the real problems of daily life in a unique and original way. The improvement of self-awareness, by means of the simulation of real life situations ("role playing") [21] during individual or group cognitive-behavioural therapy [22], may increase the social feedback and thus might reduce the social disability of the persons with ABI [23].

Multi-disciplinary rehabilitation for acquired brain injury and more intensive programs in post-acute rehabilitation have been associated with earlier functional gains [24]. Recommendations for clinical practice and research in severe brain injury in intensive rehabilitation have also been proposed [25].

As for the psychosocial functioning, empathy disorders and coping style after ABI is a key concept, which also contributes to social reintegration [23-26].

Successful social reintegration is a complex process which depends not only on the early holistic approach to the persons with ABI and the caregivers, but also on a long-term psycho-educational support to accompany the whole family to community re-entry.

Conflict of interest statement

The authors report no conflict of interest.

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